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METHOD OF AND SYSTEM FOR COMPUTER-CONTROLLED DISTRIBUTION OF
INFORMATION VIA MULTIPLE ALTERNATIVE COMMUNICATION SYSTEMS

BACKGROUND OF THE INVENTION

[0001] This invention relates to a method of computer-controlled distribution of information via a number of different alternative communication systems and to a system for the application of the method.

[0002] The transmission of documents between different parties, such as between different companies or between companies and private individuals, is typically carried out via the post office or via electronic document transmission such as by fax or e-mail. There is, however, a desire to limit the use of letter post as much as possible, particularly within the business community, because of the extensive amount of paper handling and paper consumption not only for documents but also for envelopes. At the same time, postal charges are high and postal service is relatively slow and, sometimes, rather unreliable. As an alternative, the use of fax transmission reduces paper handling, and the information reaches the recipient very quickly. In addition, the sender can obtain confirmation that the information has arrived.

[0003] As a further alternative, E-mail offers even greater benefits. Transmission of information can occur without the use of paper, such as when the information is written into computer memory at the premises of the sender and is transferred to the recipient and read off on the recipient's computer monitor, thereby enabling the recipient to decide whether the message is to be stored electronically, stored on paper, or not stored at all. An advantage of e-mail is that the electronically-stored information can be edited by either the sender or the recipient, or transferred completely or in part to a storage medium or working files so that the information can be used for data processing.

[0004] Though electronic communication has considerable advantages when compared to letter post, the latter is still greatly used not only for private mail, as expected, but also for outgoing mail from companies that typically have the equipment for electronic communication.

[0005] U.S. Patent No. 5,513,126 (Harkins et al) describes a known network using electronic communication channels. The network is provided to change the information transmitted by a sender according to a communication profile established by the recipient. The invention presupposes that the sender and the recipient are subscribers of the network and are equipped with devices for electronic communications. The invention, however, provides no incentive to parties that use correspondence by mail to change to electronic communication.

[0006] There are several reasons that electronic communication is only used to a limited extent despite such equipment being available. One reason is that some documents are only suitable for physical conveyance, namely, original material, such as signed legal documents, or material distributed at a large volume, such as books and other extensive printed material. Another reason which should, however, be able to be largely eliminated is uncertainly of the sender as to whether the recipient has the facilities to receive and handle electronically transmitted information and, if so, by what means and to what address. By contrast, virtually every contact has a known postal address, so that the postal service is mostly used for correspondence. For example, authorities and institutions such as banks regularly use the postal service for sending messages, injunctions, transaction confirmations, account communications and, in particular, invoices. Thus, in spite of its advantages, relatively widespread use of electronic communication is limited to messages between companies and other parties between which there is close interaction and a frequent exchange of information.

[0007] It is therefore advantageous to companies, institutions and authorities to replace their use of the postal service with electronic communication whenever possible. The gains would not only be realized in the service being mechanized and having the least possible manual involvement but also in that the information may be produced by the sender in a considerably more mechanized way and be able to be used by the recipient directly as input for further processing and storage. By contrast, data from paper documents must often be transferred manually into a digital form before it can be worked on. This is particularly important for accounting operations, as most companies presently do their bookkeeping, ledger entries and financial reports by means of data processing systems using computers. Thus, paper documents such as invoices, bank statements, etc, must be entered manually in order to be integrated into the data processing systems.

SUMMARY OF THE INVENTION

[0008] The invention provides computer-controlled selection of distribution paths for information of various kinds produced on the premises of a sender such that the best available distribution path is selected.

[0009] Information is produced in data form on the premises of a sender and is transferred to a "distribution exchange" which independently analyses the information with respect to the reception address and type, and based on the analysis, selects the best communication path and thereafter controls the distribution. The method and the system for its implementation create many opportunities both on the premises of the sender and the recipient for high-level mechanization of the production and further processing of the information.

[0010] The invention also provides a high level of security against incorrect processing of the data, both on the premises of the sender and of the recipient. Similarly, high security against incorrect addressing and against siphoning off of information to unauthorized parties is attained.

[0011] Additionally, the system can be introduced and utilized on the premises of the user without extensive installation, and much of the work involved in the entry of basic data, utilization of new computer programs and training of personnel can be eliminated by the method and system of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The method and system of the invention are described with reference to the attached drawings which show the system schematically.

[0013] Figure 1 shows a functional block diagram of a system which produces and distributes information on the premises of the sender in accordance with the invention; and

[0014] Figure 2 shows a functional block diagram of a corresponding system that receives the information distributed by the system of Figure 1.

DETAILED DESCRIPTION

[0015] The method and system of the invention are first described with reference to an application for distributing accounting information and associated correspondence within a company or institution. Below are listed various processes associated with an accounting system and various documents used by such a system.

[0016] I. The debiting procedure:

1. Production of basic debiting data based on recorded deliveries, work carried out, etc.
2. Generation of debiting data including:
 - a) addressee,
 - b) specification,
 - c) amount, and
 - d) terms.
3. Internal recording of the debiting data for the drawing up of:
 - a) ledgers,
 - b) payment follow-up, and

- c) financial reporting.
- 4. Production of invoices in a form determined by the method of distribution. (See 5 below).
- 5. Distribution of the invoices using any of the following methods:
 - a) the postal service,
 - b) fax transmission,
 - c) by e-mail outputted via a printer located on the premises of the recipient, and
 - d) direct electronic transmission of data to a data processing system located on the premises of the recipient in accordance with agreed addressing.

[0017] II. The reception process:

- 1. Arrival of invoice/invoicing data via:
 - a) the postal service,
 - b) fax transmission,
 - c) e-mail and a printer, or
 - d) direct input of data into the recipient's data system in accordance with agreed addressing.
- 2. Sorting of correspondence based on its content such as:
 - a) payment instructions, such as invoices and demands for fees;
 - b) reports of financial data concerning payments made, payments received, balances, etc.;
 - c) other finance-related correspondence, such as queries concerning invoices issued, requests for quotes, orders, and messages concerning payment difficulties;
 - d) correspondence not related to finances but which require action, such as injunctions, demands from an authority, or other correspondence with a fixed reply deadline; and

- e) correspondence not related to finances but of a general and informative nature.
- 3. Internal distribution of the incoming correspondence in accordance with one of the above classifications:
 - a) Correspondence determined to be within the above classifications 2a) and 2b) is to be recorded as financial data in the internal accounting system which is typically computer-based;
 - b) correspondence determined to be within the above classification 2c) is to be distributed internally to the department or person responsible for the matter;
 - c) for correspondence determined to be under the above classification 2d), the deadline is to be noted and the communication distributed to the person responsible for responding to the action refers; and
 - d) messages with possible relevance to the current business are to be distributed to the departments/persons concerned for information and possible action.

[0018] Thus, finance-related correspondence (classifications 2a and 2b) is recorded in the recipient's computer-based accounting system with relatively little manual processing. Other correspondence (such as classifications 2c, 2d, and 2e) can not be automatically handled to the same extent but practically always requires personal consideration and action. However, computer-based tools such as checking and memory functions, word-processing, etc., can be used.

[0019] III. Processes initiated by incoming correspondence include:

- 1. Payment processes, which after the arrival of an invoice or other payment demand and its recording in a computer-based accounting system may be paid

automatically via a bank, a bank check or transfer or a postal check using a computer program.

2. Financial reporting, for a computer-based accounting system, using a suitable computer program.
3. Follow up of financial reports that may result in the redistribution of funds, taking up or payment of loans, reorganization of certain business activities and other measures under the responsibility of the management for which computer-based tools can only be used to a limited extent.
4. Correspondence not related to finance or financial management activity which are controlled by computer only for certain activities having well-established, frequently used routines which may need additional computer-based tools.

[0020] As shown by the above list, there is a great need to mechanize the debiting procedure (I) using computer-based data processing. The first precondition for using such computer-based data processing is that the sender has access to a computer-based accounting system and to suitable computer programs. Such access is available to large companies, and to an ever increasing extent to smaller companies, but is always available for companies and institutions with extensive financial management tasks, such as banks, insurance companies and certain authorities. However, the distribution (I.5) of invoices and other payment demands has not been fully mechanized as the distribution depends upon the reception capabilities of the recipient and the sender's knowledge of the recipients.

[0021] For received correspondence (II) there is similarly a dependence upon the medium used by the sender which, as mentioned above, may not be the most mechanized distribution channel due to uncertainty about the availability of various means of distribution. The form of the received correspondence is likewise affected by this uncertainty. If distribution

takes place in a less mechanized way which is not based on electronic methods, the possibility of mechanizing the sorting (II.2) and recording operations using the computer-based accounting system (II.3a and b) is also adversely affected, so that there can be only a manual implementation. When recording in the accounting system has been carried out, the subsequent accounting measures (III.1, and 2) can be carried out intelligently if the accounting system is so designed.

[0022] Accounting systems within companies and institutions are intrinsically well suited to computer-aided mechanization, as shown by such mechanization being introduced relatively quickly and widely within financial sector. As can be seen from the above, the main obstacle to optimal mechanization is the lack of automation of the distribution of the finance-related correspondence. Another obstacle, particularly for smaller companies, is a lack of investment of funds and time for setting up a well-mechanized accounting system.

[0023] Though accounting systems are described herein as an area well-suited to the utilization of the invention, the invention is likewise applicable to other areas where repeated routines occur. Such areas include the booking of tickets and the ordering of goods.

[0024] Other sent and received types of correspondence, which are not based on set repeatable routines as those used in accounting do not provide the same opportunities for mechanization but require a considerable degree of personal decision-making and action. Here, it will largely continue to be necessary to utilize the available mechanization tools, such as computer-based information systems, computer-based management tools, etc. However, even here, mechanized distribution may be utilized. This is carried out to an ever increasing extent by fax transmission and by e-mail. However, restrictions also apply because it is not known what reception options the recipient has, and thus the expensive and slow postal service is often used.

[0025] The system and method of the invention, as well as its implementation for debiting procedures, will be described with reference to the block diagram shown in Figure 1.

[0026] Figure 1 depicts a system comprising three main parts: a sending party's unit 1, shown above and to the left of the dotted line in the figure, an external service unit 2, shown to the right of the dotted line, and the recipient's unit 3, shown below the dotted line. The sender's unit 1 comprises one or more of the following: a computer 4, a scanner 5, a server 6 including its requisite memory units, an accounting system 7, a printer 8, and a control unit 9 for correspondence and its distribution. Within the sender's unit 1 may be several of these devices. Alternatively, some of these units may be omitted, whereas other types of data processing and storage devices may be included in their place. However, there must be at least one device for entering electronic data into the control device 9 and at least one printer 8 connected to this device. The accounting system 7 may alternatively be designed as a function within the system and thus need not be a separate hardware device. Rather, the accounting system can be integrated into the rest of the data processing system as functions such as the ability to enter financial data, store and process this data, and output the output data produced from the entered data by means of data processing.

[0027] The service unit 2 can be used by several sender's units 1 located on the premises of a company or institution. The service unit is connected to control devices via connections 15, which can be cable links or wireless connections but is preferably a connection via a data network.

[0028] The service unit 2 comprises a data register 16 having an advanced search function for searching and extracting particular data from a large quantity of stored data. A connection device 17 is connected to an incoming connection 15 from the unit 1 to a data register 16 and to

outgoing connections 18, 19 and 20. In addition, it is assumed that the connection device 17 is connected to one or more computers 21 with monitors and keyboards that provide a human interface.

[0029] The sender's unit 1 and the service unit 2 are intended for communication with a number of recipients units 3. The recipient units 3 can have different equipment for the reception of correspondence, such as an incoming postbox 25 for receiving postal correspondence, a fax machine 26, a printer 27 connected to a computer for delivery of e-mail, and a data storage and a data processing device 28 for reception of data using special addressing and activation codifying. The recipient units 3 can have a greater or lesser degree of mechanization, ranging from where the postal services are used only for registered documents up to where a comprehensively developed system exists with a special addressing and activation functions unit 28. Such functions include transfers between accounts in different banks where a codified remote message initiates the transaction using account entry and subsequent confirmation operations. The different extent of mechanization of the recipient units 3 on the premises of a prospective recipient is the cause of the above-mentioned uncertainty regarding which choice of means of distribution can be used.

[0030] As mentioned above, the service unit 2 is connected to the control device 9 which, in turn, is connected to receive data produced in the data system of the sender's unit 1 and to control the printer 8. The control device 9 transmits information via the line 15 to the control device 17 of the service unit 2 during breaks in the transmission of the same data to the printer 8. The transmission to the service unit initiates a search process in the register unit 16 for correspondences with the identification data obtained from the control device 9 and, in particular, to locate the name and address information stored in the register unit 16.

[0031] The search process described above can result either in a relevant electronic address being found in the identification data obtained from the control device 9 or from the register unit 16, or the search process may result in no data being found. If an electronic address is found, the service unit takes over the forwarding, which is carried out electronically via an addressable data device 28, an e-mail system 27 or a fax system 26 in that order of priority. If no electronic address is found, the received data is returned to the control device 9 and forwarded to the printer 8 to print out the corresponding document for delivery by post.

[0032] Directory information stored in the service unit may be obtained from a number of sources such as telephone directories, fax directories, e-mail directories, official directories, etc., which are generally available in digital form and often by CD-ROM. As much as possible, each address is supplemented with an address suitable for electronic communication, such as may be delivered to electronic addressing unit 28 using its codes, or by using an e-mail address or fax number.

[0033] If no useable electronic address can be found, the correspondence is delivered to the recipient's incoming postbox 25 by being generated by the sender unit's printer 8 and then sent via the normal postal service. In other words, the correspondence is printed out using the printer 8 and sent to the recipient by post as a letter. Alternatively, electronic communication to the recipient is sent as mentioned above via the service unit 2. Accordingly, the fax system 26 is connected to the connection device 17 of the service unit 2 by the line 18, the printer-computer 27 is connected to the service unit 2 by the line 19, and the addressable computer device 28 is connected to the service unit 2 by the line 20. The connection can be made via a cable or by wireless transmission and, preferably, by a data network.

[0034] As an example of the invention, a debiting procedure is implemented using the control device 9. The control device 9, as described above, is connected to the server 6 to receive data in a form that can control the printer 8 for the printing out of documents. The documents may be invoices or other payment demands which are produced in the sender's unit 1 in various ways, such as by manual entry of data via the computer 4, by scanning documents using the scanner 5 and/or by obtaining data received from the accounting system 7. The data to be entered in the accounting system may be delivery notes, work reports or incoming debits from sub-suppliers which may already be recorded in a form suitable for entry in the computer or scanner, for example.

[0035] The entered data is then delivered from the server 6 to the control device 9 which forwards the data via the connection 15 to the service unit 2 during a temporary break in the connection between the control device 9 and the printer 8. Recipient addressing data incorporated in the transmitted data is then sent to the data register 16 for search. The data stored in the register 16 comprises name and address information for the group of addresses that is within the territory covered by an agreed to service provided by the service unit 2. If electronic addresses are found for the intended recipients of the data, electronic transmission is selected with priority given to obtaining a connection to the addressable unit 28 or, if not available, then to the connection via e-mail or, if also not available, by fax. If any of these capabilities are available, the service unit 2 produces, from the data received from the control device 9, an invoice for electronic distribution. The transmitted data is typically supplemented with additional data from the sender for printing out a complete invoice having the sender's logo, etc. In addition, text may be included which indicates that the communication is the sole invoice and that there will be no delivery by post.

[0036] As noted above, electronic transmission of the data may only be carried out when an electronic address for the intended recipient is found by the search. When such an address is found, the electronically transmitted invoice replaces the invoice ordinarily sent via the postal service, and the control device ensures that no data is supplied to the printer 8 so that no postal delivery may take place. However, when no electronic address is found by the search, the data is returned to the control device for forwarding to the printer 8. An invoice is thus produced that is handled in the normal way for postal delivery. Also, a report is sent from the service unit 2 to the sender's accounting system 7 which indicates that the invoice has been sent and the communication medium used.

[0037] The method of the invention, using the control device and the service unit, is described here as an example with reference to a debiting operation. However, the method of the invention may also be used for other correspondence such as follow-up communications after the debiting, such as reminders and dunning letters. Further, the method of the invention can also be used for other correspondence where the sender cannot immediately find the available distribution paths and where electronic transmission is preferable to the postal service.

[0038] Also within the scope of the invention, the operation of control device 9 can be extended to include additional functions. For example, the printer 8 may only be used temporarily for a given function, for example invoicing, and otherwise have more general uses. It is therefore desirable to include a program in the control device which is activated when the above-described function of the control unit is to be put into effect, that is for alternative production of a printed communication or an electronic communication sent via the service unit 2. When the program is not active, the printer is connected directly to the server or

other device in the sender's unit for normal printer applications. Moreover, when the above-described program is put into effect, supplementary data may be included for creating a document with a company logo or other information that is to be printed directly by the printer instead of using pre-printed header paper or other forms. Such supplementary data may be entered in the service unit but may alternatively be found in a data program for activating the printer by the control device. Activation of the control device also activates the above-mentioned reporting function and the updating of the accounting system 7.

[0039] The activation of the programs used by the sender's unit may instead be carried out by a command entered via, for example, the computer 4 or via a keyboard connected directly to the control device. Alternatively, a diskette or CD-ROM containing a program may be connected. A further alternative is to provide the control device, or a device connected to the control device, with a card reader. A program can be read directly from the cards or activated from memory by reading the relevant cards. The cards can be clearly marked so that no errors occur, which is particularly important in connection with accounting. The cards can also be distributed only to authorized personnel, so that misuse, such as fraudulent debiting, can be prevented.

[0040] Figure 2 shows, in greater detail, how received correspondence is handled according to the method of the invention using an internal system 35 located on the premises of the recipient, shown between and to the left of the dotted lines. Above the upper dotted line are shown distribution methods 25-28 which correspond to those shown in Figure 1 and which represent possible paths by which correspondence may arrive at the system 35. Below the lower dotted line, the same distribution methods 25-28 are shown but represent possible paths for outgoing correspondence. To the right of the dotted vertical line is shown the service unit 2 for outgoing

correspondence. It is assumed that most of the users of the method and the system of the invention will be able to both send and receive correspondence. Here, separate internal systems are described for these functions but, in practice, both functions may be integrated to form in a common correspondence unit designated as 1,35.

[0041] The devices incorporated in the internal system 35 include a sorting station 36 to which postal correspondence 25, fax messages 26 and e-mails 27 are directed. The incoming material is then sorted, which is typically carried out manually. The incoming material is then delivered by an employee at station 37 or entered via, for example, a computer into a server 38 to be stored for processing internally. The data can, for example, be information from incoming invoices which is recorded manually. The data can also arrive at the server 38 from an employee station 37.

[0042] Electronically addressable data 28 is typically entered directly into the server for processing directly, without passing through the sorting station 36. As indicated by the path 40, the server 38 is typically connected to the unit 1 for the production and dispatch of correspondence, as shown in Figure 1. It is therefore possible for the functions of the servers 6 and 38 to be located in the same internal system.

[0043] The above operations are described with respect to internal handling. If, however, the service unit 2 is also used for handling incoming data, the sorting station 36 is also connected to the service unit 2, either directly or via a scanner 41. Electronically addressable messages are also directly delivered via the distribution path 28 to the service unit 2 for transmission to the server. Employees may also input messages either directly to the service unit or, possibly, also via a scanner. The service unit 2 is preferably arranged for such data processing so that, at least to a certain extent, scanner messages can be analysed (OCR

function) for the production of, for example, sender identification for further automatic data processing. The data so produced is transmitted to the correspondence system 1,35 for registration.

[0044] The distribution paths for outgoing correspondence, shown by lower boxes 25-28, operate in the manner described above in connection with the description of Figure 1. As in the previous example, correspondence to be sent via the postal service is prepared internally within the company via a combination of the control device 9 and the printer 8. In addition, a fax machine 26 is available as are capabilities for sending e-mail 27 and, possibly, addressable transmission 28. Employees may also send correspondence via one of the above-mentioned distribution paths without using the service unit. However, the service unit may, instead, be used in the manner described above for the selection of the distribution path using a direct connection to the service unit or via a scanner. The server 38 also typically has a bi-directional connection with the service unit 2, as described above, via a control unit such as the control unit 9.

[0045] Data thus arrives at the service unit 2 from various sources: (1) from a system 28 when the data is an addressable electronic message, (2) from the sorting station 36 when the data is entered either directly or via a scanner, (3) from entry by an employee at station 37 and (4) from the server 38 either directly or via a control device. For data arriving from the sorting station 36 and/or from the employee, or from the server 38 and then via a control unit, the service unit performs the above-described search operation and implements distribution in the manner described in connection with Figure 1.

[0046] The method and the system of the invention selects the most advantageous distribution path in a simple manner by making use of an automatic process controlled by a separate database equipped with search functions for finding addresses

in a comprehensive address directory. The automatic handling of data provides impetus for the user's contacts to change over to electronic communication to create an even larger group of users by which this means of communication is used regularly.

[0047] The use of the service unit for distribution, both for internally initiated distribution and for distribution initiated by the incoming correspondence, can provide a reason for transferring additional services to the database. The channels of communication which are set up can improve book-keeping operations by the organization of the database. Particularly, for smaller companies, the method of the invention may result in lower handling costs, greater security and reduced need for personnel than with corresponding internal financial handling.

[0048] The above description uses the printer 8 which is connected to the sender unit 1 rather than being connected to the service unit 2. The control device 9 can thereby operate such that the service unit only handles electronic distribution of the computerised information, whereas information that is to be sent by post is handled by the sender unit's printer 8 so that a document is produced which can be handed to the postal services on the part of the sender unit. This embodiment of the invention is particularly suitable if there is a large quantity of document transmissions that are to be sent via post or in another way, such as by courier, for which electronic addressing is not applicable. For example, the addressees may not have fax or an e-mail address or may require original copies of documents.

[0049] Within the scope of the invention, one or more printers may be connected to the service unit, so that the control device or other control function connected to the service unit activates the connected printer to print out documents when a search in the address directory of the service unit finds no address for electronic distribution. The

document is then processed for forwarding as a service within the service unit.

[0050] This embodiment is also suitable when it is desired to not process some documents within the sender unit. The data for the document consignments which are not processed within the user unit are also reported to the relevant function address in the same manner.

[0051] Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as defined by the appended claims.

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